Memorandum for Holders
USIB-D-71.6/3
16 January 1970

UNITED STATES INTELLIGENCE BOARD

MEMORANDUM FOR HOLDERS OF USIB-D-71.6/3

SUBJECT : Second Annual Report of the Intelligence Information Handling Committee

REFERENCE : USIB-D-71.6/3, 21 August 1969

Annex B (Education and Training) of the Second Annual Report of the Intelligence Information Handling Committee (IHC) is circulated herewith to all holders of the reference document. This Annex supplements Chapter VIII, the Education and Training section of the subject report.

25X1A

[redacted]

Executive Secretary

Attachments

NAVY, DIA, DOS, USAF, ARMY review(s) completed.

C-O-N-F-I-D-E-N-T-I-A-L

Attachment
Memorandum for Holders
USIB-D-71.6/3

ANNEX B
IHC-AR-2
16 January 1970

UNITED STATES INTELLIGENCE BOARD

INTELLIGENCE INFORMATION HANDLING COMMITTEE

MEMORANDUM FOR: The United States Intelligence Board

SUBJECT: Annex B, Education and Training, to the Intelligence Information Handling Committee (IHC) Second Annual Report, Fiscal Year 1969

REFERENCES:
(a) USIB-D-71.6/3, Subject Second Annual Report of the Intelligence Information Handling Committee, 21 August 1969

(b) CODIB-D-113.5/8, Subject: Information Science Training for Intelligence Personnel, 4 April 1968

Enclosed herewith is the Education and Training Report, Annex B, to the IHC Annual Report covering the community information science training activity for FY-69. This report supplements Chapter VIII, Education and Training, of Reference (a), above. It is the Second Annual Education and Training Report. The first report was published as Reference (b) above.

[redacted]
Chairman

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Attachment:
As Stated

C-O-N-F-I-D-E-N-T-I-A-L

Confidential

USIB
UNITED STATES
INTELLIGENCE
BOARD

Intelligence Information Handling Committee

EDUCATION AND TRAINING REPORT

Confidential

Annex B
IHC - AR - 2
1 July 1969

WARNING

This document contains information affecting the national defense of the United States, within the meaning of Title 18, sections 793 and 794, of the US Code, as amended. Its transmission or revelation of its contents to or receipt by an unauthorized person is prohibited by law.

Approved For Release 2003/10/01 : CIA-RDP79M00097A000100070003-2

ANNEX B
IHC-AR-2
1 July 1969

UNITED STATES INTELLIGENCE BOARD

INTELLIGENCE INFORMATION HANDLING COMMITTEE

Annex B (Education & Training) to the
Second Annual Report

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Group 1

Excluded from automatic downgrading and declassification.

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APPENDICES

A. Introduction

1. Scope

This is the second annual Information Science Education and Training Report. It is issued as Annex B to the Second Annual Report of the Intelligence Information Handling Committee. This report covers primarily the information science training received by personnel of the intelligence community during Fiscal Year 1969. However, since the first "Information Science Training for Intelligence Personnel" report (CODIB-D-113/5.8, 4 April 1968, forwarded by USIB-D-39.7/28, 4 April 1968) covered the period from March 1967 through March 1968, it was necessary to gather some FY-68 statistics and include them in this report in order that a comparison could be made with the FY-69 figures. The call for data to be used in preparing this report was contained in IHC-D-113.5/9 dated 20 May 1969.

2. Explanation of Terms and Content of the Report

a. Statistics

The statistical information portions (Section B and Appendices) of this report are structured to show courses by source, category and number, and students by number and type.

(1) Courses

The sources are: (1) universities; (2) own agency; (3) other government agencies; and (4) manufacturers, contractors, and professional societies. The categories of

courses with a brief definition of each category and a few sample course titles are as follows:

(a) General Orientation

Introductory orientation courses, short or long, which survey the broad field of information processing. Courses in a specific aspect of information science such as "introduction to computer programming" would not be considered as general orientation. Examples of General Orientation courses include:

- Basic Concepts of Data Processing
- ADP Orientation
- Executive Orientation in Data Processing
- Introduction to ADP Techniques and Information Systems
- Introduction to Computer Science

(b) System Analysis and Design

Those courses which equip the student to perform information processing systems analysis and design functions. Included in this category are problem analysis, feasibility study, fact finding and fact analysis, design, documentation, implementation and evaluation, etc. Examples of these courses are:

- Systems Design and Analysis
- ADP Systems Analysis
- Methods of Operation Research
- Introduction to Analysis
- System Design and Communication

(c) Computer Programming

Courses which provide application and systems programming instruction to equip the trainee to write computer

instructions, to program computer operating systems, to modify manufacturers-provided software, etc. This category also includes such subjects as specific programming language, file and record structures, use of standard software, functions and elements of specific operating systems, and design of compiler languages. Examples are:

- Formatted File System
- FORTRAN, COBOL, etc.
- Programming Techniques
- Operating Systems Coding
- Software Design

(d) Application

Those courses which have as their objective the improvement of one's capability to obtain the required information in a timely and efficient manner. Examples of these courses include:

- Application of Information Science Technology to Estimating and Warning
- General Courses in Information Science Showing Application to Specific Intelligence Functions
- Introductory Survey Course of Intelligence Information Handling Systems
- Search Strategy

(e) Methods and Techniques

Courses within the information science field having to do with methodology but which do not fit into the other categories, e.g., indexing and abstracting, operating system concepts, computer engineering, storage and retrieval

concepts, mathematics and statistics (if related to information science application), etc. Sample courses are:

- Operating System Concepts
- Punch Card Principles
- Project Control System for Data Processing
- Principles & Procedures in ADP Systems
- Management Standards for ADP
- Introduction to Digital Computer Engineering
- Information Storage

(2) Students

The statistical information portions of this report show the number of students for each agency by source and category of courses. The statistics also include a grouping of the students by four grade levels and whether they are military or civilian. The number of students are further shown by classification as user or systems personnel as defined below:

(a) User Personnel

Users are defined as all personnel other than operators of information handling systems and support personnel. This includes executives, supervisors, etc., other than those assigned to intelligence information handling organizations.

(b) Systems Personnel

Systems personnel are systems operators and systems support personnel. They include all personnel assigned to or being trained for assignment to an intelligence

information handling organization, such as: CIA's Office of Computer Services, Central Reference Service, and other ADP and information handling activities; NSA's Central Reference Center and Office of Machine Processing; State's Substantive Information Systems Staff and Automated Data Processing Division; DIA's ADPS Center and Intelligence Support Office (DIAAP-10); and DoD IDHS elements.

b. Narrative

The narrative information contained in this report includes the following:

(1) description of training programs and actions taken to improve the quality and extent of training during FY-69;

(2) an assessment of what the training received in FY-69 has done for the organization;

(3) comments on experience in hiring persons already trained in information science; and

(4) education and training plans for FY-70.

B. Statistics

1. Trends

25X1A A total of [redacted] students from the intelligence community participated in information science training during FY-69 as

25X1A compared to [redacted] students in FY-68. Table 1 shows a comparative count of students for FY-68 and FY-69. The right hand section of Table 1 shows the number of users (figure above the line) versus

the number of systems personnel (figure below the line) while the data in the center section presents combined totals of user and system personnel. The [redacted] students for FY-69 25X1A
25X1A consisted of [redacted] system personnel. 25X1A
The ratio of user students to system students in FY-69 was approximately the same as in FY-68. In most cases the number of system personnel seems high compared to the number of user personnel. Since the community is only beginning to exploit the technological advances applicable to information handling systems, this ratio of user students to system students may have been justified. An increase in both categories is necessary. The Education and Training Subcommittee (E&TS) believes that the number of user students should exceed system
25X1A students by approximately [redacted] Table 2 shows the total number of students for FY-69 distributed by agency, showing military and civilian with four grade levels under each. Data in these eight categories are further subdivided as to system and user personnel.

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2. Courses and Students

a. Summary

A total of 657 information science courses were taken by members of the intelligence community in FY-69. The top section of Table 3 shows the tabulation of these courses for the community as a whole. The number of students who took the courses are shown in the lower section of Table 3. A similar table for each of the member organizations of the community is contained in Appendix 1.

(1) Student Distribution by Source Category

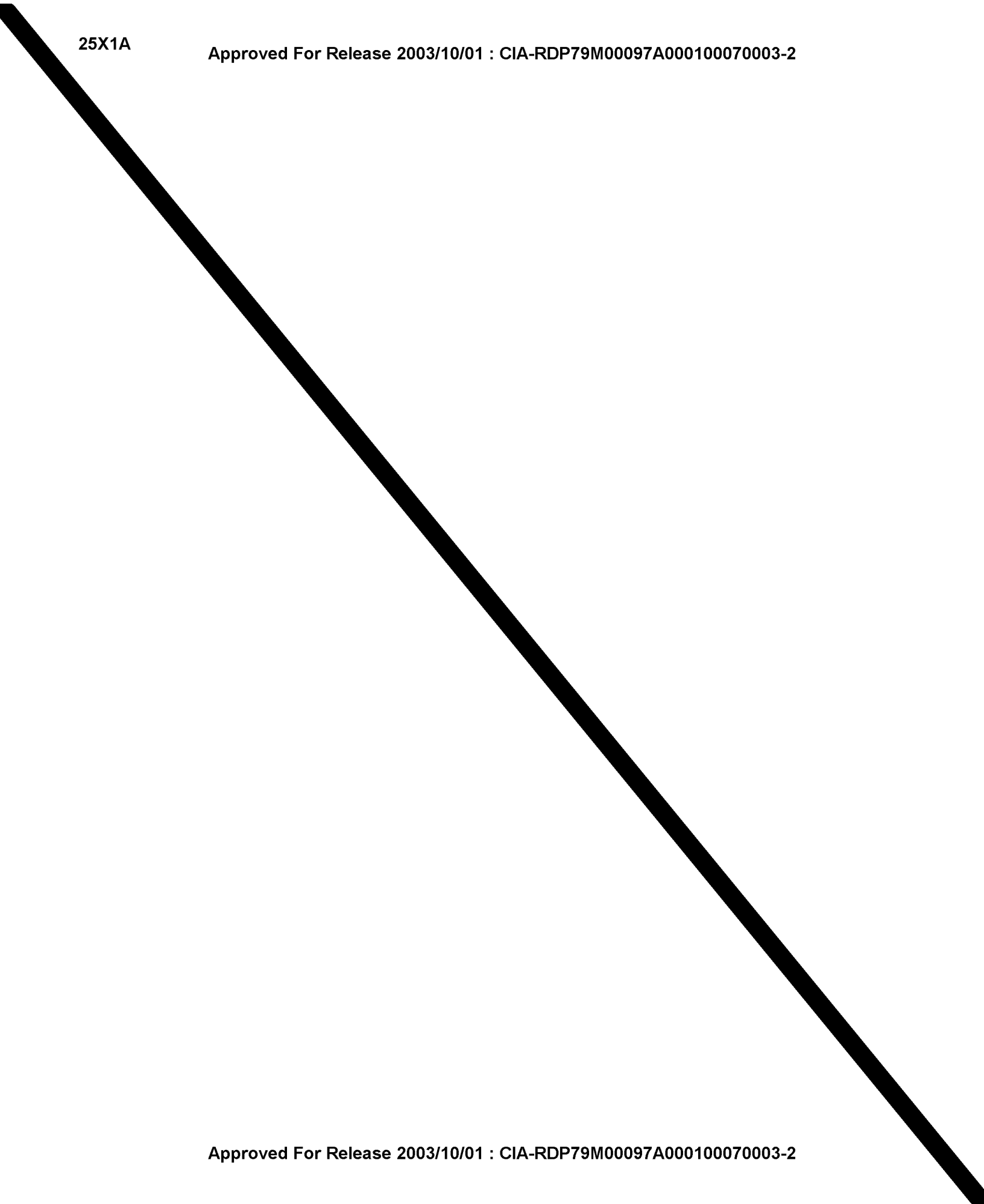
The percentage distribution of students, for the community, by source of education and training is listed below:

(a)	Universities	(17%)
(b)	Own Agency	(58%)
(c)	Other Government Agencies	(16%)
(d)	Manufacturers, Contractors, and Professional Societies	(9%)

(2) Student Distribution by Course Category

The category of courses with the percentage of students taking each of these categories are listed below:

(a)	General Orientation	(36%)
(b)	System Analysis and Design	(10%)
(c)	Computer Programming	(36%)
(d)	Application	(7%)
(e)	Methods and Techniques	(11%)



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The statistics presented in this report and summarized above indicate that the relative low number of students taking Systems Analysis and Design Courses, and Application Courses is a serious deficiency in the total program. It is a known fact that the community relies to a great extent on external contractor assistance for system analysis and design. With rare exception, contractor personnel are judged inferior to qualified "in-house" personnel for this purpose. In the case of Application Training (i.e., the improvement of one's capability to obtain the required information in a timely and efficient manner) thousands of individuals need to be trained in this science as compared to the [redacted] who were trained in FY-69. 25X1A

b. Specific Courses and Number of Students

(1) University

The number of students by agency and by university courses taken are listed in Appendix 2. Programs of instruction for university courses taken on a full-time basis are listed in Appendix 6. Most of the full-time courses and students contained in Appendix 6 are also included in Appendix 2. The purpose of Appendix 6 is to furnish information at a student level of detail. This information will be helpful to employees, their supervisors, training officers and managers in evaluating courses taken and in evaluating the improvement in the capability of the students who took the training. The Education and Training

Subcommittee of the IHC should be provided useful comments pertaining to the full-time university courses, so that it can assist the community in the development and implementation of its information science training program. During FY-69 the intelligence community had [ ] who 25X1A
completed training on a full-time basis at various universities. 25X1A
This was a major improvement as compared to FY-68 when only [ ] received full-time university. Contrasted to the overall improvement, one military department reported that none of their intelligence personnel were enrolled in an information science course on a full-time basis during FY-69. However, to make a significant impact on improving the community's expertise in information science, more intelligence personnel should take appropriate courses at qualified universities. None of the full-time university courses taken during the past year were completely responsive to the varied and complex needs of the intelligence community. The Washington, D.C. area universities accounted for over two-thirds of [ ] 25X1A
full-time university students, American -- [ ] Maryland -- [ ] 25X1A
25X1A and George Washington [ ] The remaining [ ] were divided 25X1A
among 22 universities throughout the U.S. The universities in the Washington, D.C. area appear to have a geographic attraction not matched by their curricula. However, there would be an increase in cost to the agencies if greater use were made of universities remote from the Washington, D.C. area.

(2) Own Agency Courses

Appendix 3, Own Agency Courses, shows a total of [redacted] as shown in lower section of Table 3. The difference is that the [redacted] Air Force students taking courses given by the Armed Forces Air Intelligence Training Command (AFAITC), Lowry Air Force Base, are shown under own agency in the lower section of Table 3, but they are shown on page one of Appendix 4 as Other Agency Students for comparative purposes. The Air Force is the executive agent for operation of the AFAITC. As shown in paragraph 2.a. (1) and Table 3, Own Agency Courses account for [redacted] students. An examination of Appendix 3, Own Agency Courses, suggests that each member organization of the intelligence community, with the possible exception of CIA and NSA, should give immediate attention in increasing and improving the training conducted by their own organization. This training should be designed to improve the handling of intelligence information. The DIA reported only [redacted] students and one course, "Information Systems - Their Development and Management". The Army reported [redacted], Navy [redacted] students were explained above. Of the students attending Own Agency Courses, over 45% of them took orientation courses and 44% took programming courses. What appears to be a glaring deficiency is that only [redacted] took application

training. Attention is invited to paragraph 3 of CODIB-D-113/5.7, Subject: System Training for Intelligence Personnel, dated 2 February 1967, quoted below:

> "In keeping with this approach, we have concluded that the intelligence community should strive for a balanced program featuring:
>
> - o university-level education in the formal discipline of information sciences;
> - o inclusion of additional data handling instruction in established curricula of Government intelligence training facilities;
> - o specialized training courses aimed at applying information science technology to specific intelligence problems.
>
> CODIB recommends that the latter be provided at the Defense Intelligence School."

This CODIB recommendation was forwarded to USIB members by USIB-D-39.7/20, dated 16 February 1967 and approved by USIB-M-469, dated 30 March 1967. It appears that the balanced program has not yet been implemented. 25X1A

(3) Other Government Agencies

25X1A [redacted] students and the courses offered by other government agencies are shown in Appendix 4. It appears that, with the exception of the AFAITC, none of the members of the intelligence community are taking any information science training offered by any other intelligence organization.

(4) Manufacturers, Contractors, and Professional Societies

Courses and number of students [redacted] taking training and orientation from this source are shown in Appendix 5. 25X1A

C. Improvement in Information Science Education Program

This portion of the report contains information on actions taken to improve the quality and extent of training during FY-69.

1. CIA

a. Office of Computer Services (OCS)

The OCS, located in the Directorate for Science and Technology, represents the internal focal point for CIA's information science training efforts. During FY-69 two instructors were added to OCS training staff. In addition to five courses (varying from one to 15 weeks in length) offered prior to FY-69 the following two new courses were started in FY-69.

(1) Modified ADEPT (A Development of EDP Programmer Training) Course (5 weeks full-time). This course is for experienced programmer analysts not sufficiently familiar with System/360.

(2) PL/1 Programming Techniques (1 week full-time). This course is for application programmers; intermediate programming techniques in conjunction with P/L Language.

b. Central Reference Service (CRS)

The CRS, located in the Intelligence Directorate, established a comprehensive training program of OCS courses to insure that its information science personnel receive adequate and timely training on a scheduled basis. The courses are grouped for different skill levels, e.g., ADEPT courses for trainees at the GS-9 level and below, System Design Analysis for GS-12 level, and Seminars on ADP and Management for the GS-13 level. The courses are taught by OCS personnel.

c. National Photographic Interpretation Center (NPIC)

The CIA component of NPIC uses UNIVAC-sponsored courses in home study and classroom instruction which represent its basic ADP training foundation. These courses are supplemented by a NSA sponsored RYE UNIVAC 494 Programmers Course; Decision Tables; Techniques and Applications Course, given by a Department of Agriculture Graduate School Instructor; and additional in-house and on-the-job instruction as needed.

d. Office of Economic Research (OER)

The OER gave some of their analysts a Workshop in Quantitative Methods for Economic Intelligence and stressed knowledge of FORTRAN, input-output analysis, and model building.

2. NSA

During FY-69 fewer courses were taken by an increased number of NSA personnel. For example, the number of university courses decreased from 126 in FY-68 to 106 in FY-69. However,

these figures do not reveal the extent of course changes, i.e., 64 of the courses used in FY-68 were dropped while 44 courses were taken for the first time in FY-69. Other changes made in NSA courses during FY-69 were: (1) [redacted] NSA personnel 25X1A enrolled in three after hour courses, thus allowing students full daytime attention to their jobs; and (2) commercial programmed instruction (PI) was used by [redacted] students in five 25X1A courses in an attempt to increase flexibility and reduce instructor cost. The second change revealed that commercial PI needs to be supplemented by agency-generated material in order to meet the objectives attained before PI was used.

3. Department of State

The training during FY-69 concentrated on user orientation, largely at the mid-career level, and on-the-job and manufacturers' training of systems personnel in automatic data processing and computer programming. Two short computer courses for about 20 officers at the level of Deputy Assistant Secretary and above were sponsored to inform them of some of the important fundamentals of computers and their major applications in government and industry.

4. DIA

The Agency's training efforts were designed primarily to satisfy requirements in the machine-users area for development of technical skills. The Agency sponsored seminars in "Information Systems" and a full-time academic study program in information

science for professional personnel. The seminars were custom-designed to show managers how to participate constructively in the advanced methods of systems development, with emphasis on bridging the gap between managers and data processing specialists. The full-time university study program had fourteen participants. This program has provided highly trained individuals to satisfy present and particularly future requirements in the information science areas.

5. Army

The Army's training program was designed to increase the technical competency of Army intelligence personnel in general intelligence information handling areas, and to provide a base for management and operation of installed and projected Intelligence Data Handling System (IDHS). Despite a gratifying increase in the number of officers programmed for full-time graduate study, constraints in the availability of funds resulted in curtailment of quotas. This deficiency occurred in spite of a program change decision in FY-67 which approved 15 officer "spaces" to be trained and $163,000 to pay the training costs.

6. Navy

The Naval Intelligence Processing Systems Support Activity (NIPSSA) has had assigned responsibility for ADP training since it was chartered in 1964 as a field activity

of the Office of Naval Intelligence (ONI). With the exception of technical personnel training in systems analysis, programming, and computer operation for NIPSSA, no definite program exists for training of user personnel in information science within the Naval Intelligence Command (NAVINTCOM). Course catalogs and technical school brochures are distributed to NAVINTCOM personnel and they are encouraged to take courses offered by local universities and technical schools. Navy tuition assistance is provided for approved courses. Twenty-four NIPSSA trainee and journeymen programmers and systems analysts attended computer programming courses offered by the Naval Command System Support Activity (NAVCOSSACT). This training encompasses both basic and advanced instruction in programming languages. In FY-68, on-the-job training was formalized to the extent that a definite training program was established for all newly hired civilian personnel and newly assigned military personnel. Training for intelligence data coding personnel consists of assignment to a junior position with simplified work requirements. Instruction is provided in the form of prepared procedural instruction and supervisory counseling. The trainee is advanced to more complicated work upon mastering current work assignments. The training status of the employee is considered complete within one year or when advanced to a GS-4 position. During this period and beyond, the trainee is encouraged to take information science courses available in off-duty hours.

7. Air Force

a. Air Force Institute of Technology

The Air Force Institute of Technology (AFIT) continues to manage the full-time graduate college level education program for Air Force Intelligence as well as for all other Air Force functional areas. In FY-69 intelligence was allocated 15 spaces in the graduate level electronic data processing, computer science, and information science education programs. As of 30 June 1969, eleven intelligence officers were enrolled. This was a great increase over the enrollment of only one in FY-68. The Air Force utilizes the Graduate Information Science program of Arizona State University, University of Arizona, Colorado State University, Georgia Technology Institute, Iowa State University, New Mexico State University, Stanford University and Texas A&M. It should be noted that the majority of Air Force Institute of Technology students, other than those who are intelligence officers attending graduate level courses in the information science area, are assigned to the data automation career field. The Air Force Intelligence activities have a number of data automation officer positions on their manning documents and will receive a proportionate share of those graduates assigned.

b. Armed Forces Air Intelligence Training Center

Information science training within the Air Force was conducted by the Armed Forces Air Intelligence Training

Center (AFAITC) of the Air Training Command. These courses are designed for the analysts, programmers, and computer operators assigned to Intelligence Data Handling Systems of the Department of Defense. A series of courses consisting of Concepts and Capabilities, Operations and Specifications, Data Output and Retrieval, and System Operation are offered for the IBM 1401, 1410, and 7094 Formatted File Systems, In addition, courses for the intelligence analyst (user) are also available to familiarize the analyst with the capabilities of the system. Nineteen courses were offered at the site of the user organization by mobile teams of instructors furnished by AFAITC. A total of 1,868 training spaces were filled by this training program for all of the DoD. Of this total, 691 spaces were for Air Force personnel.

c. Computer Assisted Instruction

During FY-69 the Air Force evaluated the effectiveness of teaching an intelligence data handling system course in the Computer-Assisted Instruction (CAI) mode at an operational site. A 30-hour CAI course was developed in File Query Techniques. An evaluation was performed to determine if the CAI course was as effective as conventional instruction. It is anticipated that CAI will be exploited in the future AFAITC intelligence curricula.

8. Information Science Center

The Information Science Center established at DIA in December 1967 has the mission of planning, developing, and conducting specialized courses of instruction in the application of information science to intelligence planning, estimates, and warning, and to other specific categories of intelligence problems in sufficient depth and breadth to meet the requirements of the intelligence community. The Information Science Center is organized as a part of the Defense Intelligence School. It is housed in Building T-4 at the Anacostia Naval Annex. The facility has been modified and provides classrooms and storage necessary to handle Top Secret Special Intelligence material. Against an approved program for 22 manpower spaces to develop and present two courses, the center has been authorized 11 spaces and as of 30 June 1969 had seven individuals (3 professional and 4 academic support personnel) assigned. The first pilot course is planned to be given in February and March 1970.

D. Value of Information Science Training Received

The following is an assessment of the value of the training received to the organizations of the intelligence community.

1. CIA

The ADP Orientation Courses have been useful in debunking the mystique of "the machine" and impressing the students with

the necessity to learn more about information science and the need to identify its role in their professional lives. The basic ADEPT course has enabled the Office of Computer Services to give new recruits and transferees from other components of the Agency the basic training that is necessary for a career in computer programming. It provides the equivalent of one to two years of on-the-job experience. The course has provided the fundamentals of programming so that line managers can be assured that their new programming personnel are ready to assume programming tasks when they report for duty, thus reducing the need for less efficient, individual on-the-job training. This approach to the training problem has also provided a more professional quality to the training and a higher degree of standardization in programming techniques within the Office. Experience has shown that the Agency can develop, test, and implement its own training courses in certain subjects more effectively and at a lower cost than obtaining similar training from vendors. Once developed, the recurring costs of contractor courses are eliminated. Training experiences thus far have encouraged many of the Agency's elements to take a hard look at career development of which education and training is so intricate a part. It is of interest to note that the user requires more systems training and that the programmer requires more substantive information training; therefore, each is reaching

out in an endeavor to apply the tools of information science to the substance of intelligence. In the National Photographic Interpretation Center, the training provided during the year has been invaluable in preparing "new" as well as "old"

25X1D

personnel to cope with the development and operation of the [redacted] which is due for implementation in the latter

2. NSA

Since application of computers is so vital an aspect of NSA operations, it is axiomatic that they continue to expose their employees to knowledge of information science. Agency use of education and training opportunities has helped information science professionals to keep abreast of the expanding technology, has promoted career development of professionals in related fields, and has introduced both newly-hired and on-board employees to the field.

3. Department of State

25X1A

About [redacted] students attended a mid-career course sponsored by the Department's Foreign Service Institute in Computers and

25X1A

Foreign Affairs, and another [redacted] were exposed to quantitive methodologies in courses on Contemporary Political Analysis and Theories of International Relations. A time-sharing mobile computer terminal was installed at the Foreign Service Institute (FSI) for use in economic and other courses. The same service

is used by the Economic Bureau and by the Office of Communications. The FSI also employed a special academic consultant (Judah Schwarts, Computer Learning Specialist, MIT Education Research Center) during the fiscal year to advise the FSI on uses of information science techniques in FSI's training courses.

4. DIA

Training in the information science area in FY-69 resulted in an overall upgrading level of expertise among participating Agency personnel. The increase in the number of personnel who have received training in this area will add measurably to the manpower assets needed to alleviate the shortage of trained information science personnel. Parallel benefits were experienced in the areas of professional development and employment incentives.

5. Army

Training has supported the continued operation of Army Intelligence Information Handling activities. However, the major problem is that the army does not have adequate numbers of personnel who posses the required skills. This situation is further aggravated by the frequent rotation of qualified military personnel and their loss by leaving the military service. Civilian employees skilled in automatic data processing or other information science fields are hard to retain in IDHS billets.

6. Navy

It has been NIPSSA's experience that it takes a minimum of 18 months to two years to develop a journeyman programmer qualified to design programs and code them in MAP, COBOL or FORTRAN. An additional year's experience is necessary before the individual is competent to tackle a system as large as the Ocean Surveillance Information System (OSIS). As of January 1969, NIPSSA had developed a staff of 14 fully trained programmers and 12 additional programming personnel with training and work experience ranging from one month to 23 months. As of March 1969, NIPSSA had a nucleus of four fully trained personnel ready to assume program maintenance responsibilities for the OSIS systems, with six more in various stages of training and/or experience. The NIPSSA training program has proved to be successful in providing trained and experienced programmers. The attrition rate for trainees has been relatively low because of the promotional opportunities available to the trainee as his experience and skills increase.

7. Air Force

The quality and quantity of information science training in the Air Force was considered satisfactory in FY-69. Without the AFIT education program, AFAITC IDHS training program, and the manufacturer sponsored technical courses, the operational capability of ADP support to intelligence would have been severely

degraded. With the improvements planned for FY-70, the Air Force education and training program should continue to satisfy requirements.

E. Hiring of Experienced Personnel

Member agencies reported that [redacted] with experience or degrees in information science were employed during FY-69. 25X1A

25X1A [redacted] were employed by one agency; however,

25X1A [redacted] left one intelligence agency for employment with another USIB organization. One organization reported that its loss of experienced personnel exceeded its gains. The intelligence community has had difficulty in hiring experienced and trained personnel. However, the number of college graduates who have had one or more courses in computer technology or who have had computer experience while in college has increased. This, combined with the high loss rate of qualified personnel and not continuing personnel on the job for which they were trained, makes it imperative that the community train more employees in information science. The recruiting and retention experience gained by the community suggests that starting salaries and promotion policies are not competitive with other government agencies and private industry.

F. Education and Training Plans for FY-70

1. CIA

a. Proposed Training

The majority of the in-house training programs run in FY-69 will be continued with necessary modifications and updating.

However, the Agency does not wish to duplicate "in-house" that training which can be better supplied by an outside component provided it meets the Agency needs. Based on the Agency needs, its program will undoubtedly reduce participation in external contractor and manufacturer courses. Attendance at colleges, universities, and other government agencies' programs will probably continue about the same. The Systems Development Staff of OER plans to conduct more advanced workshops on specific topics such as Optimization, Regression Analysis and Model Building in coordination with OCS's training staff. The OCS plans to introduce the following new courses in FY-70:

(1) ALC Macro Writing (1 week full-time): Students will be trained in writing assembly language macros for application programs.

(2) APL/360 (5 afternoons part-time): This course will provide an introduction to APL/360 (a terminal-oriented system) and to the APL programming language.

(3) Systems Analysis (2 weeks full-time): For experienced project leaders program and systems analysts) in the application of advanced or third generation techniques to EDP systems design.

(4) FORTRAN IV Course (10 mornings part-time): Students will be trained in all aspects of the FORTRAN IV programming

language. Some of the topics covered are: constants, variables, arithmetic expressions, looping instructions, input/output instructions, format statements and subroutines. While most of the time will be spent using the FORTRAN compiler, the sessions will also include some use of the WATFOR compiler, a FORTRAN-like compiler.

(5) Mathematics for ADP Systems Analysts (4 one-week sessions): These courses will provide the systems analyst with a better understanding of problems which involve mathematical theories. The Office of Computer Services is offering, through a contract with the General Electric Company, the Mathematics for Systems Analysts series which consists of four (4) one-week sessions:

(a) Basic Mathematics

(b) Advanced Methods and Models

(c) Statistical Inference

(d) Probabilistic Models

(6) PL/1 Macro Writing Course (5 mornings part-time): PL/1 Compile-Time Facilities are presented in detail. Practical application of the macro facilities is demonstrated.

b. Personnel Programmed for Information Science Training

Listed below are the number of CIA personnel programmed for information science training in FY-70.

(1) Universities and Technical Schools

(a) Full-time:

(b) Part-time:

(2) In Own Agency:

25X1A

(3) Other Government Agencies: [redacted] 25X1A

(4) Manufacturers, Contractors, and Professional Societies: [redacted] 25X1A

c. Budget Estimate for FY-70 Information Science Training

In projecting the budget for FY-70, students and instructors salaries were estimated at [redacted] and expenditures for course fees and hardware and software training at [redacted] 25X1A 25X1A thus an estimated budget of [redacted] for information science training. Since the Agency does not have a line item in its training budget for information science training, the above estimate is based upon researching expenditures made and projected within certain Agency elements together with analysis of full-time student attendance and average student salaries.

2. NSA

a. Proposed Training

The FY-69 courses will be used as needed in FY-70. A projection for 17 courses anticipates [redacted] students. The following new courses will be given: 25X1

(1) NSA TIPS/TITLE/COINS User Training

(2) POGOL Programming

(3) SIGMA 5/7 Programming

b. Personnel Programmed for Information Science Training

No rigid program exists for either external or internal training in information science. The courses to be offered by NSA

and local universities will be announced in late summer to the NSA elements and requirements for courses will be collected through management channels. Use of courses by other government agencies and manufacturers is principally determined after specific announcements are made. The NSA training program for FY-70 is expected to be similar to their FY-69 program.

c. Budget Estimate for FY-70 Information Science Training

A separate budget item for information science training is not identified. It is estimated that information science training absorbed about 17% of NSA's internal training resources and 22% of its external training resources in FY-69.

3. Department of State

a. Proposed Training

During FY-70 the Department plans to continue its one-week courses in Computers and Foreign Affairs, to re-offer its one-week courses in Quantitative Methodology in Political Science, and to intensify the general exposure of its substantive officers to the uses of computers in the research and decision-making process through other computer-assisted courses. Three officers are scheduled for full-year academic training in systems analysis. A consultant will be hired from the Political Science Department, Minnesota University, to suggest improved methods of training in the quantitative social sciences.

b. Personnel Programmed for Information Science Training

Approximately 175 persons are scheduled for formal training at FSI in FY-70, 52 in other government agencies, and 10 by manufacturers, contractors, and professional societies.

c. Budget Estimate for FY-70 Information Science Training

25X1A

An estimated [redacted] in direct costs will be allocated for information science training by the Foreign Service Institute in FY-70. Some of the training discussed above will be funded separately.

4. DIA

a. Proposed Training

In FY-70 DIA will continue to make information science training available on a high priority basis. A particular effort is being made to keep abreast of important training developments in the information science field. The Agency will continue to utilize training facilities and courses that were offered during FY-69. The recent withdrawal of free technical training by one of the major hardware firms has prompted the Agency to realign a portion of its training resources for FY-70. In FY-70 the Agency plans to present, primarily for user personnel, two seminars in "Information Systems - Their Development and Management". The purpose of these seminars is to impart a better understanding of the systems approach. In addition to other benefits, this should result in more efficient utilization of existing production and

support facilities. Similar seminars were held during FY-69 with excellent results. The seminar was especially beneficial for attendees from the Agency's System Analysis Group.

b. Personnel Programmed for Information Science Training

The following number of persons have been programmed for information science training in FY-70:

(1) Universities and Technical Schools

(a) Full-time: 7

(b) Part-time: 125 (approx.)

(2) In Own Agency: 60

(3) Other Government Agencies: 75 (approx.)

(4) Manufacturers, Contractors, and Professional Societies: 45 (approx.)

c. Budget Estimate for FY-70 Information Science Training

The Agency's proposed budget for information science training during FY-70 is [redacted].

25X1A

5. Army

a. Proposed Training

Training will continue, subject to the constraints of personnel space allocations and fund availability.

b. Personnel Programmed for Information Science Training

Eleven Military Intelligence (MI) Branch officers are scheduled to matriculate in universities or technical schools for full-time study in FY-70 specializing in ADPS. It is estimated that

additional matriculations in Operations Research/Systems Analysis (OR/SA) fields will bring the total of MI officers entering training close to the 20 envisioned by the OSD Program outlined in paragraph III.D.1.b.(1) of Memorandum CODIB-D-113/5.8, 28 March 1968, subject: Information Science Training for Intelligence Personnel.

c. Budget Estimate for FY-70 Information Science Training

Costs for information science-related training to be accorded Army Intelligence personnel in FY-70 is estimated at $475,000. This excludes cost of on-the-job training and self-development programs. None of these funds are included in the Consolidated Intelligence Program (CIP).

6. Navy

a. Proposed Training

Training in information science planned for FY-70 will include the complete range of instruction offered by local universities, technical schools, and contractors for third generation equipment operation and utilization. NIPSSA personnel will be scheduled to attend courses applicable to their assignments at technical schools and contractor facilities. NAVINTCOM and NIPSSA personnel will be encouraged to enhance their careers by enrolling in courses offered by local universities. Courses in disciplines associated with second generation equipment will be reduced considerably.

b. Personnel Programmed For Information Science Training

The CY-67 Program Change Decision included an approved program for NAVINTCOM to send ten officers and ten civilians for full-time university or technical school training in FY-70. Due to budget cuts the funds for this program were eliminated. The NAVINTCOM is working with BUPERS to have information science included in the Navy's graduate program for career intelligence officers. A specific civilian intelligence careerist program for full-time university training in information science has not been developed but is under study. However, civilian intelligence personnel may make application to the Office of Civilian Manpower Management for full-time university training in information science as a part of the general program for training Navy civilian personnel. NAVINTCOM personnel attendance at part-time university courses is expected to decline in FY-70 because of budgetary cuts. A reduction of $5,000 from the requested $25,000 will eliminate approximately 40 candidates. NAVINTCOM has no plans for an in-house facility for the conduct of information science training and/or education. It is anticipated that NIPSSA will utilize the NAVCOSSACT training facility in FY-70 at approximately the same rate as FY-69. While a decline is expected in IBM 7090 training, the gain in COBOL, FORTRAN, and third generation PL/1 is expected to increase significantly to offset the decline in second generation programming language training. NIPSSA plans to utilize the manufacturing and contractor facilities at an increased

rate. However, this could be altered after 1 January 1970 when announced changes for these services will take effect. If personnel scheduling difficulties prevent attendance at the increased rate, funding limitation will undoubtedly cause a curtailment of this source of training.

c. Budget Estimate for FY-70 Information Science Training

The NIPSSA budget for information science training for FY-70 is [redacted]. Funds for the 20 full-time university students are not included in the NIPSSA budget.

25X1A

7. Air Force

a. Proposed Training

The Intelligence Information Handling System Environmental Training Facility being established at the Armed Forces Air Intelligence Training Center (AFAITC) will install an IBM 360/40H computer system in November 1969. This system will provide the air intelligence student the same type of computer support that he will find in the field. The officer and enlisted men's air intelligence curricula will be completely redesigned. A total of 84 hours of information/computer science training will be provided each student officer early in the course followed by 45 hours of computer applications during the remaining phases of the 29 week course. During FY-70 plans will be made to develop an intelligence data handling systems officer course whereby fully qualified intelligence officers can be crosstrained for computer

analyst, programmer or management positions within IDHS organizations. The graduates of this program will supplement the Air Force Institute of Technology graduates as input to the intelligence data handling function. A corresponding revision was made in the enlisted men's course. For the first time IBM 1410 Formatted File System (FFS) and Small Scale COBOL Formatted File System courses will be offered in residence at AFAITC. The first class for analysts, programmers, and equipment operators being assigned to the DoD IDHS installations in Southeast Asia is scheduled for June 1970. Heretofore, all FFS training was accomplished at the site of the user by mobile training teams. The resident courses will greatly benefit intelligence data handling system organizations in short tour areas such as Southeast Asia since analysts, programmers, and operators will arrive for duty fully trained.

b. Personnel Programmed for Information Science Training

Listed below are the number of Air Force personnel programmed for information science training in FY-70.

(1) Full-Time Universities:

(a) Electronic Data Processing Systems - 8 Masters Candidates

(b) Electronic Devices - 1 PhD Candidate

(c) Information Systems - 2 Masters Candidates

(d) Electrical Engineering - 1 Masters Candidate

(e) Electronics - 1 Masters Candidate

(2) Part-Time University and Technical Schools: Personnel assigned to Air Force Intelligence organizations make extensive use of part-time educational programs. Many of the courses are in the information science area. Since central records of this type of educational program are not available, an estimate cannot be given.

(3) In Own Agency: Approximately 700 Air Force personnel are programmed to receive information science training at AFAITC.

(4) Other Government Agencies - Unknown

(5) Manufacturers, Contractors: Since records of this type of training are not maintained, an estimate cannot be made. However, extensive use of manufacturers courses has been made in the past and should continue in FY-70.

c. Budget Estimate for FY-70 Information Science Training

(1) AFAITC Information Science Training Program -

(2) AFIT Graduate Level Information Science Program for Intelligence -

Total

25X1A

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* This budget includes AFAITC support to all of DoD.

8. Information Science Center

The Information Science Center operated by the Defense Intelligence School for personnel of the USIB organizations will introduce two courses in the third quarter of FY-70.

a. The first pilot course will be Information Science in Support of Intelligence Functions--an 8-week course for 20 students. This course will cover how intelligence analysts obtain the information they work with, the nature of information, how information can be processed to obtain the information desired, the nature of communication, how desired information can be communicated, the nature of an information system, how an information system can be evaluated and improved, an examination of information systems available to intelligence analysts, an examination of information systems being developed, the nature of decisions, and some means for intelligence analysts to evaluate their decision-making process and determine how to improve it. This course is scheduled to start 2 February 1970.

b. The second course will be a Survey of Existing Community Information Handling Systems. This course will cover the intelligence system, its organization, communications and information flows within and among the USIB organizations. The pilot course is scheduled to start on 6 April 1970.

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UNIVERSITY COURSE
PROGRAMS OF INSTRUCTION TAKEN ON A FULL-TIME BASIS (cont'd)

DIA

STUDENT IDENTITY NO.	UNIV ATTENDED on a FULL-TIME BASIS	COURSE TITLE	CREDIT HOURS	NO. OF QUARTERS OR SEMESTERS COMPLETED	INFORMATION SCIENCE DEGREES GRANTED
1	American University	Publication Tech	3		
		Management of ADP Systems	3		
		Indexing & Abstracting	3		
		Info & Reporting System	3		
		Computer Programming	3		
		Info Science and Tech	3		
		Automatic Data Processing	3		
		The Systems Approach	3	2 s	
2	American University	Probability	3		
		ADP Management	3		
		ADP Systems	3		
		Software Evaluation	3		
		ADP Seminar	3		
		Managerial Statistics	3		
		Computer Programming	3		
		Advanced Mathematics	3		
		Methods of Opns Research II	3		
		Intro to Mgt Math	3	2 s	
3	American University	Computer Programming III	3		
		ADP Systems	3		
		Managerial Statistics	3		
		Types & Uses of Scientific & Tech Info	3		
		Advanced Computer Applications	3		

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ANNEX B
Appendix 6
1 July 1969

UNIVERSITY COURSES
PROGRAMS OF INSTRUCTION TAKEN ON A FULL-TIME BASIS (cont'd)

DIA

STUDENT IDENTITY NO.	UNIV ATTENDED on a FULL-TIME BASIS	COURSE TITLE	CREDIT HOURS	NO. OF QUARTERS OR SEMESTERS COMPLETED	INFORMATION SCIENCE DEGREES GRANTED
3	American University	Problems & Statistics for Mgt Decisions	3		
		Technical Info Machine Systems	3		
		Seminar in Computer Systems	3		
		Evaluation of Software	3		
		Introduction to ADP	3	2 s	
4	American University	Advanced Computer Application	3		
		ADP Systems	3		
		The Systems Approach	3		
5	American University	ADP Management	3		
		Math 2	3		
		Systems Design	3		
		The Systems Approach	3		
		Mgt Info & Report. Systems	3		
		Technology & Admin	3		
		Intro to Mgt Math	3		
		Advanced Computer Application	3	2 s	
6	American University	Seminar in Mgt Info Opns Systems	3		
		Seminar in Computer Systems	3		
		Concepts on Indexing & Abstracting	3		
		Managerial Statistics	3		
		Advanced Computer Application	3		
		The Systems Approach	3		
		Evaluation of Software	3	2 s	

UNIVERSITY COURSES
PROGRAMS OF INSTRUCTION TAKEN ON A FULL-TIME BASIS (cont'd)

DIA

STUDENT IDENTITY NO.	UNIV ATTENDED on a FULL-TIME BASIS	COURSE TITLE	CREDIT HOURS	NO. OF QUARTERS OR SEMESTERS COMPLETED	INFORMATION SCIENCE DEGREES GRANTED
7	George Washington University	Survey of ADP	3		
		Advanced Administrative Mgt	3		
		Mathematics for Mgt	3		
		Quantitative factors in Administration	3		
		Mgt Info Systems Development	3		
		Mgt of Data Process Opns	3		
		Advanced Digital Computer Concepts	3		
		Comparative ADP & Mgt	3	2 s	
8	American University	Managerial Statistics	3		
		Intro to Mgt Math	3		
		The Systems Approach	3		
		ADP Systems	3		
		Mgt Info & Report. Systems	3		
		Computer Programming	3		
		Mgt of ADP Systems	3	2 s	
9	American University	Advanced Computer Applications	3		
		ADP Systems	3		
		The Systems Approach	3	1 s	
10	American University	Systems Approach	3		
		ADP Systems	3		
		Advanced Computer Applications	3	1 s	

UNIVERSITY COURSES
PROGRAMS OF INSTRUCTION TAKEN ON A FULL-TIME BASIS (cont'd)

DIA

STUDENT IDENTITY NO.	UNIV ATTENDED on a FULL-TIME BASIS	COURSE TITLE	CREDIT HOURS	NO. OF QUARTERS SEMESTERS COMPLETED	INFORMATION SCIENCE DEGREES GRANTED
11	American University	ADP Systems	3		
		Advanced Computer Applications	3		
		The Systems Approach	3	1 s	
12	American University	Managerial Statistics	3		
		ADP Systems	3		
		The Systems Approach	3		
		Use of Accounting Methods	3		
		Mgt Info & Report Systems	3		
		Systems Design for Business Opns	3		
		Management of ADPS	3	2 s	
13	American University	Probability Stats for Management	3		
		Computer Design	3		
		The Systems Approach	3		
		Advanced Mgt Math	3		
		Software Evaluation	3		
		Ops Research in Mgt	3		
		Advanced Computer Applications	3		
		Management of ADPS	3	2 s	
14	George Washington University	Dig Computer Sys Mgt	3		
		Quant Factors in Administration	3		
		Mgt of ADP Organ	3		
		Systems Analysis by Simulation	3		
		Organizations & Mgt	3		
		Adv Dig Computer Concepts	3	2 s	

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ANNEX B
Appendix 6
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UNIVERSITY COURSES
PROGRAMS OF INSTRUCTION TAKEN ON A FULL-TIME BASIS (cont'd)

DIA

STUDENT IDENTITY NO.	UNIV ATTENDED on a FULL-TIME BASIS	COURSE TITLE	CREDIT HOURS	NO. OF QUARTERS SEMESTERS COMPLETED	INFORMATION SCIENCE DEGREES GRANTED
15	George Washington University	Stat. & Probability Administration Mgt Quant Factors in Mgt	3 3 3	1 s	
16	American University	The Systems Approach ADP Systems Adv. Computer App	3 3 3	1 s	
17	American University	Types & Uses of Scientific/Tech Info Sys Advanced Applications Concepts of Indexing & Abstracting Evaluation of Software Seminar in Com. Sys. Publication Tech Mgt of ADPS	3 3 3 3 3 3 3	2 s	
18	American University	ADP Systems Computer Programming Managerial Statistics The Systems Approach Advanced Computer Applications Computer Design Sys Design for Bus Opns Mgt of ADPS	3 3 3 3 3 3 3 3	2 s	

UNIVERSITY COURSES
PROGRAMS OF INSTRUCTION TAKEN ON A FULL-TIME BASIS (cont'd)

DIA

STUDENT IDENTITY NO.	UNIV ATTENDED on a FULL-TIME BASIS	COURSE TITLE	CREDIT HOURS	NO. OF QUARTERS SEMESTERS COMPLETED	INFORMATION SCIENCE DEGREES GRANTED
19	Harvard University	Special Programming	3		
		Quant. & Econometric Methods	3		
		Analytic Geometry & Calculus	3		
		Automatic Data Processing	3		
		Computer Graphics	3		
		Matrix Algebra	3	2 s	
20	American University	ADP Systems	3		
		Sys Design for Bus Opns	3		
		The Systems Approach	3		
		Evaluation of Software	3		
		Business Data Processing	3		
		ME-TE Programs	3		
		Human Factors in Computer Bases Sys	3	2 s	
21	American University	ADP Systems	3		
		Adv Computer Appl	3		
		The Systems Approach	3	1 s	
22	American University	Intro to ADPS	3		
		ADP Systems	3		
		The Systems Approach	3		
		MA Research Seminar	3	1 s	
23	Georgia Institute of Technology	Computer Systems	3		
		Equipment of Info Sys	3		
		Dig Computer Orgn	3		

UNIVERSITY COURSES
PROGRAMS OF INSTRUCTION TAKEN ON A FULL-TIME BASIS (cont'd)

DIA

STUDENT IDENTITY NO.	UNIV ATTENDED on a FULL-TIME BASIS	COURSE TITLE	CREDIT HOURS	NO. OF QUARTERS SEMESTERS COMPLETED	INFORMATION SCIENCE DEGREES GRANTED
23	Georgia Institute of Technology	Topics in Linguistics	3		
		Non-numeric Info Processing	3		
		Problems in Sys Design	3		
		Computer Language Design	3		
		Orgn & Mgt of Info Storage	3		
		Computer Tech for Info Storage & Retrieval	3		
		Computer Design Language II	3		
		Info Systems Design	3		
		Info Representation & Structure	3		
		Classification & Indexing	3		
		Graph Theory	3	4 q	
24	American University	Adv Computer Appl	3		
		The Systems Approach	3		
		ADP Systems	3	1 s	
25	American Univeristy	The Systems Approach	3		
		ADP Systems	3		
		Adv Computer Appl	3	1 s	

UNIVERSITY COURSES
PROGRAMS OF INSTRUCTION TAKEN ON A FULL-TIME BASIS (cont'd)

STATE

STUDENT IDENTITY NO.	UNIV ATTENDED on a FULL-TIME BASIS	COURSE TITLE	CREDIT HOURS	NO. OF QUARTERS ON SEMESTERS COMPLETED	INFORMATION SCIENCE DEGREES GRANTED
1	Harvard University	Decision Analysis	3	1 s	
2	University of Maryland	Quantitative Economics	3	1 s	

UNIVERSITY COURSE
PROGRAMS OF INSTRUCTION TAKEN ON A FULL-TIME BASIS (cont'd)

ARMY

STUDENT IDENTITY NO.	UNIV ATTENDED on a FULL-TIME BASIS	COURSE TITLE	CREDIT HOURS	NO. OF QUARTERS OR SEMESTERS COMPLETED	INFORMATION SCIENCE DEGREES GRANTED
1	George Washington University	Dig Computer Prog Concepts Comparative Dig Computer Sys Mgt of a Data Processing Orgn Seminar: ADV Dig Cmptr Concepts Case Studies in Bus. Admin	3 3 3 3 3	2	MBA (ADP) June 1969
2	American University	Computer Programming Principles of Management Seminar in S&T Info Sys Pol & Econ of R&D The Administrative State Principles of Pub Pers Admin R&D Mgt: Planning & Control of Res Opns Technology & Admin Science & the State Theory & Method of Pol. Res.	3 3 3 3 3 3 3 3 3	3	MA (Pub Admin) June 1969
3	University of Pennsylvania	ADP Business Statistics Quant Meth (Intro to Ops Rsch) Labor & Pers Mgt Thesis Info Sys Design Comparative Mgt Production Mgt Personnel Admin	0 1 1 1 1 1 1 1 1	3	None (Scheduled MBA) (Ind Mgt/OR) December 1969

UNIVERSITY COURSES
PROGRAMS OF INSTRUCTION TAKEN ON A FULL-TIME BASIS (cont'd)

ARMY

STUDENT IDENTITY NO.	UNIV ATTENDED on a FULL-TIME BASIS	COURSE TITLE	CREDIT HOURS	NO. OF QUARTERS OR SEMESTERS COMPLETED	INFORMATION SCIENCE DEGREES GRANTED
3	University of Pennsylvania	Econ of Latin Am Opns Rsch Opns Rsch in Orgs Int'l Bus Mgt Special Study Project	1 1 1 1 1		
4	USNPGS Monterey, California	Mgt Statistics I Microeconomic Theory Cmptr Orgn & Programming Logical Design of Digital Computers Mgt Statistics II Sys Programming I Cmptr Sys Design Intro to Linear Algebra Sys Programming II Data Processing Mgt Business Data Processing Opns Rsch for Mgt Mgt Info Sys Mil Appl of ADP Opns Rsch for Mgt II Computer Science	5 4 4 4 4 4 4 3 4 4 4 4 4 4 4 3	4	MS (Cmptr Sys Mgt)
5	Ohio State University	Statistics Organization Safety (750.13) Safety (503)	5 3 3 3	2	None (Scheduled MBA (OR/SA) January 1971

UNIVERSITY COURSES
PROGRAMS OF INSTRUCTION TAKEN ON A FULL-TIME BASIS (cont'd)

ARMY

STUDENT IDENTITY NO.	UNIV ATTENDED on a FULL-TIME BASIS	COURSE TITLE	CREDIT HOURS	NO. OF QUARTERS OR SEMESTERS COMPLETED	INFORMATION SCIENCE DEGREES GRANTED
5	Ohio State University	Calculus Accounting Business Orgn Business Law Admin Principles	5 3 3 4 3		
6	University of Georgia	Business Law Principles of Marketing Finite Math Elementary Economic Statistics	5 5 5	1	
7	University of Pennsylvania	Accounting Business Statistics Econ. Anal & Policy Production Mgt Fortran Financial Accounting Fund of Data Processing Mgt of Production Resources Industrial Stat Control Legal Aspects of Business Marketing Mgt Econ Anal & Policy II Pers and Labor Mgt	1 1 1 1 0 1 1 1 1 1 1 1 1	3	None (Scheduled MBA) (Ind Mgt/Opns) May 1970

UNIVERSITY COURSES
PROGRAMS OF INSTRUCTION TAKEN ON A FULL-TIME BASIS (cont'd)

ARMY

STUDENT IDENTITY NO.	UNIV ATTENDED on a FULL-TIME BASIS	COURSE TITLE	CREDIT HOURS	NO. OF QUARTERS OR SEMESTERS COMPLETED	INFORMATION SCIENCE DEGREES GRANTED
8	University of Florida	Dig Cmptr Prog Matrix Meth in Sys Eng Transform Meth in Sys Eng Opns Rsch	2 3 3 3	1	None (Scheduled ME) (OR) March 1971
9	University of Georgia	Principles of Acctg Principle of Marketing Business Law Principle of Econ	5 5 5 0	1	None (Scheduled MBA) (Bus/OR) March 1971

Three additional MI Officers have matriculated for Graduate Degrees in ADPS but details of courses taken are not yet available.

UNIVERSITY COURSES
PROGRAMS OF INSTRUCTION TAKEN ON A FULL-TIME BASIS (cont'd)

AIR FORCE

STUDENT IDENTITY NO.	UNIV ATTENDED on a FULL-TIME BASIS	COURSE TITLE	CREDIT HOURS	NO. OF QUARTERS OR SEMESTERS COMPLETED	INFORMATION SCIENCE DEGREES GRANTED
1	University of Arizona	Computer Org & Programming	3	0	MS Information Systems Engineering
		Adv Analysis for Engineers A	3		
		Adv Analysis for Engineers B	3		
		Discrete Sys I	3		
		Engineering Stat & Probability I	3		
		Basic Human Factors Engineering	3		
		OPS Research I	3		
		Discrete Sys II	3		
		Eng Stat & Prob II	3		
		Human Factors in Eng Design	3		
		Non Numeric Application & Dig Computer	3		
		OPS Research II	3		
		Thesis	6		
		Organic Sys I	3		
		Theory of Sys Prog	3		
		Non Numeric Appl of Dig Computer	3		
		Queing Theory	3		
		Organization Theory II	3		
2	University of Arizona	Discrete Sys I	3	3	MS Information Systems Engineering
		Human Factors in Eng Design	3		
		OPS Research I	3		
		Eng Stat & Prob I	4		
		Numerical Analy	3		
		Discrete Sys II	3		
		OPS Research II	3		
		Eng Stat & Prob II	4		

UNIVERSITY COURSES
PROGRAMS OF INSTRUCTION TAKEN ON A FULL-TIME BASIS (cont'd)

AIR FORCE

STUDENT IDENTITY NO.	UNIV ATTENDED on a FULL-TIME BASIS	COURSE TITLE	CREDIT HOURS	NO. OF QUARTERS OR SEMESTERS COMPLETED	INFORMATION SCIENCE DEGREES GRANTED
2	University of Arizona	Prog for Sci Appl	3		
		Adv Anal for Eng	3		
		Computer Organ & Programming	3		
		Adv Analysis	3		
		Theory of Sys Prog II	3		
		Non Numeric Appl of Dig Comp	3		
		Adv Digital Comp Prog	3		
		Inf Ret & Correlation	3		
		Non Numeric Appl of Dig Comp II	3		
		Deterministic Sys II	3		
		Thesis	6		
3	New Mexico State University	Comp Prog I	3	2	MS Computer
		Intro to Mod Algebra	3		
		Comp Sys Design	3		
		Comp Prog II	3		
		Computer Logic	3		
		Info Systems	3		
		Dig Analysis of Eng Prob	3		
		Prog Lang & Trans I	3		
		Adv Prog Lang & Trans II	3		
		Special Problems	3		
		Comp Sys Org	3		
		Simulation Lang & Tech I	3		
		System Prog	3		

UNIVERSITY COURSES
PROGRAMS OF INSTRUCTION TAKEN ON A FULL-TIME BASIS (cont'd)

AIR FORCE

STUDENT IDENTITY NO.	UNIV ATTENDED on a FULL-TIME BASIS	COURSE TITLE	CREDIT HOURS	NO. OF QUARTERS OR SEMESTERS COMPLETED	INFORMATION SCIENCE DEGREES GRANTED
4	Texas A & M	Comp Prog I	3	2	MS Electronic Data Processing
		Bus Prog	3		
		Theory of Prob	3		
		Math for Eng & Science	3		
		Comp Prog II	3		
		Adv Prog Lang & Trans	3		
		Comp Sys Organ	3		
		Simulation & Lang I	3		
		Data Structure & Processing	3		
		System Prog	3		
		Adv Prog Lang & Trans	3		
		Info Storage & Retrieval	3		
		Dig Anal & Eng Prob	3		
		Spec Prog	3		
		Spec Prog	3		
5	Texas A & M	Prog of Dig Comp	4	4	MS Computer Science
		Prin of OPS Resch	4		
		Stat Anal	4		
		Comp Lang	4		
		Data Proc Mgt	3		
		Comp Software Sys	3		
		Regression Anal	3		
		Adv Qual Control	4		
		Probs	1		
		Logic of Info Proc	4		
		Problems	1		
		Prod & Inv Cont	4		

UNIVERSITY COURSES
PROGRAMS OR INSTRUCTION TAKEN ON A FULL-TIME BASIS (cont'd)

AIR FORCE

STUDENT IDENTITY NO.	UNIV ATTENDED on a FULL-TIME BASIS	COURSE TITLE	CREDIT HOURS	NO. OF QUARTERS OR SEMESTERS COMPLETED	INFORMATION SCIENCE DEGREES GRANTED
5	Texas A & M	Probs Seminar Numerical Anal	2 2 4		
6	Georgia Institute of Technology	Dig Comp Org & Prog Topics of Lings Infor Sys Logic Sys Seminar Non Numeric Infor Sci Comp Sys Syn of Nat Lang Info Rep & Struct Mod Algebra OPS Research Comp Lang Des Design of Comp OP Sys Prob in Sys Des Org & Inf Ind Syn Dir Comp Spec Prob in Infor SC Sys Theory Infor Proc	3 3 3 3 1 3 3 3 3 3 5 3 3 2 3 3 3 3 3	4	MS Information Science
7	Georgia Institute of Technology	Topics in Lings Logistic Sys Into to Comp Sys	3 3 3	3	MS Information

UNIVERSITY COURSES
PROGRAMS ON INSTRUCTION TAKEN ON A FULL-TIME BASIS (cont'd)

AIR FORCE

STUDENT IDENTITY NO.	UNIV ATTENDED on a FULL-TIME BASIS	COURSE TITLE	CREDIT HOURS	NO. OF QUARTERS OR SEMESTERS COMPLETED	INFORMATION SCIENCE DEGREES GRANTED
7	Georgia Institute of Technology	Finite Math	3		
		Mod Algebra	3		
		Into to Prob	3		
		Non Numeric Infor Proc	3		
		Comp Sys	3		
		Sys Theory & Appl	3		
		Methods of OPS Res	5		
		Infor Central Methods	3		
		Infor Sys	3		
		Infor Rep & Struct	3		
		Cybernetics	3		
		Equip of Infor Sys	3		
		Infor Sys Design	3		
		Experimental Stat	4		
		Switching Theory & Logic Design	3		
		Theory of Class & Indexing	3		
		Prob in Sys Des	2		
		Comp Tech for Infor Storage & Ret	3		
		Design of Comp OPS Sys	3		
8	Iowa State University	Comp Org & Prog	4	3	MS Computer Science
		Stats in Res I	4		
		Intro to Numerical Tech for Comp	3		
		Comp Org & Prog	4		
		Theory of Matrices	3		
		Stat for R.W. II	4		

UNIVERSITY COURSES
PROGRAMS ON INSTRUCTION TAKEN ON A FULL-TIME BASIS (cont'd)

AIR FORCE

STUDENT IDENTITY NO.	UNIV ATTENDED on a FULL-TIME BASIS	COURSE TITLE	CREDIT HOURS	NO. OF QUARTERS OR SEMESTERS COMPLETED	INFORMATION SCIENCE DEGREES GRANTED
8	Iowa State University	Intro to Switching Circuits	3		
		Comp Prog	3		
		Stat Theory for Research Worker	3		
		Stat Theory for Research Worker II	3		
		Prog Lang & Sys	3		
		Struct of Proc	3		
		Numerical Sol of Ordinary Diff Equations	3		
		Math Logic	3		
		Prog Lang & Sys	3		
		Struct & Proc of Infor	3		
		Numerical Sol to Diff	3		
		Principle of Comp Design	3		
		Prog Lang & Sys	3		
		Struct & Proc	3		
		Comp Math of Linear Alg	3		
		Principle of Comp Design	3		
9	Arizona State University	Semi Cond Mat & Dev	3		PHD Electronic Engineering
		Random Proc	3		
		Comm Theory Sem	3		
		Elect Optics	3		
		Stochastic Proc	3		
		Infor Theory	3		
		Comm Sys	3		
		Semi Cond Dev Theory	3		
		Elect Optics	3		
		Dialectics & Estimation Theory	3		

UNIVERSITY COURSES
PROGRAMS ON INSTRUCTION TAKEN ON A FULL-TIME BASIS (cont'd)

AIR FORCE

STUDENT IDENTITY NO.	UNIV ATTENDED on a FULL-TIME BASIS	COURSE TITLE	CREDIT HOURS	NO. OF QUARTERS OR SEMESTERS COMPLETED	INFORMATION SCIENCE DEGREES GRANTED
9	Arizona State University	Quantum Theory of Noise French Research Res Dissertation Modulation Theory Dissertation Semi Cond Device	3 6 6 12 3 12 3		
10	Colorado State University	Not available Capt. Haley completed requirements for MS early in FY-69			MS Computer Science
11	Stanford University	Not available Capt. Mandell completed degree requirements early in FY-69			MS Computer Science

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